CHAPTEK XXIII

VALUATION OF THE PHOSPHORUS CONTENT OF THE PIG IRON

THE desire to utilise the raw material in the most complete manner directed attention to the phosphorus content in the pig iron, which in the Thomas-Gilchrist process yields a good saleable by-product, the value of which not inconsiderably lowers the manufacturing cost of the steel. In the basic open-hearth furnace, the removal of the phosphorus takes place under similar conditions to those in the basic Bessemer converter; therefore it appears possible to win it in a useful form. The following remarks should render clear the composition pig iron must possess in order to render possible the production of a marketable phosphate slag.

The market requires a product with the highest possible phosphoric-acid content, which may in no case amount to under 14 per cent, of P205. If one fixes 17 per cent. P205 as the lowest limit, this demands that the slag must contain

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The remainder, i.e., 55 per cent., of the slag would consist of the hypothetical silicate slag. The latter must no\y by ordinary methods of working in the open-hearth furnace contain about 21 per cent. Si02, and thus the silica content of the entire slag amount to 55xO*21=about 11 per cent. There would thus be per 11 per cenb. Si02, 17 per cent. PaC^, or per 1 per cent. Si02 there would be 1*56 per cent. ¥$5.

Now since the phosphoric acid usually originates only from the phosphorus content of the pig iron, thus for each unit of weight of SiOa which reaches the slag there must be ^^=0*68 units of weight of phosphorus present in the pig iron,